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Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended to correct grammatical errors.

Support for the amended claims is found in the previously presented claims.

No new matter has been added.

Claim Rejections under 35 USC 103

1. Claims 1-4, 7, 8, 11, 12, and 21-31 stand rejected under 35 USC 103(a) as being unpatentable over Tanaka et al. (US 5,689,749).

Tanaka et al. discloses a double edged seal ring (item 40; Figures 2,3, 4, 5) having **an inner rings edge** (42; Figures 8A-8D) **for preventing rinse liquid flow (60) past a gap (clearance) (59)** (i.e., rinse liquid is held in place at clearance 59) defined by a **fixed clearance** between the inner ring and the substrate backside (col 7, lines 32-36; lines 46-50) **during the development**

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(including a rinsing process). The outer ring edge (43) prevents developer fluid (50; Figures 8A-8D) dispensed on the top of the wafer from flowing past the clearance (59) between the outer ring and the substrate backside (see col 8, lines 15-30; or, if some developer flows past the clearance it is collected in groove (41) between the inner and outer rings and discharged.

In another embodiment, a single seal ring (24; Figure 11) with a flat upper surface (col 9, lines 33-39) operates to form (trap) a liquid film between the clearance (59) created between the flat upper face of the ring and the backside of the substrate for both the developer solution and the rinse liquid (col 9, lines 44-47; col 10, lines 34-44; lines 47-54; claims 1 and 5). The creation of the liquid film in the gap (59) during the rinsing process removes the developer from the gap (59) (col 10, lines 53-54).

In both embodiments, the ring (single or double) is fixed by bolts to a lower cup during the development process (col 5, lines 52-56 (Figures 4, 13, items 24h, 24d).

Tanaka et al. discloses carrying out tests in a development process (including both applying development solution and rinse fluid) where the gap (clearance) (59 or B) was varied (by bolting

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the ring in place prior to the development process with varying clearances) over a range of 0.5mm to 1.5mm (col 8, lines 55 - col 9, line 27. The results for preventing flow of both rinsing liquid and developer was found to depend primarily on the width of the top face of the ring (col 9, lines 15-26).

Thus, Tanaka et al. fail to disclose several aspects of Applicants disclosed and claimed invention including:

"An apparatus for dispensing a liquid onto a substrate frontside and backside during a development process and adjustably controlling liquid flow on said substrate backside during said development process to improve a rinsing step,"

Nowhere to Tanaka et al. disclose or suggest an apparatus that can accomplish the function of "adjustably controlling liquid flow on said substrate backside during said development process to improve a rinsing step"

Tanaka et al. further nowhere disclose:

"a knife ring having a base and a tapered edge comprising an upper edge of said knife ring extending from said base, said

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knife ring vertically adjustably mounted beneath said support to position **said knife ring upper edge adjacent said substrate backside;**"

Tanaka et al. further nowhere disclose:

**"a plurality of independently-actuated automatic vertical adjustment mechanisms operably engaging said base of said knife ring for placing said knife ring at selected vertical positions beneath the substrate during said development process."**

Examiner ignores the structure/functional limitations of Applicants claims and simply refers to:

a) a support (see 21 Figure 3);

(b) a dispensing head (31, 23, Fig 3);

(c) a knife ring (referring to 24, Figure 15), which Examiner alleges has "a base and a tapered edge extending from said base, said knife ring being vertically adjustably mounted beneath said support.

Examiner does not identify **the base and the tapered edge** in

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the ring shown in Figure 15. Rather, Tanaka et al. disclose that the **top face** of the ring may have different configurations such as being flat (24a in Figure 12) or with grooves in the top face (24e in Figure 13), a recess in the tip face as (24f in Figure 14) or where the flat surface of the top face is inclined at an angle  $\theta$  (24g Figure 15 (see col 7, lines 23-39)). Tanaka teach that since these various top faces of the ring provide a greater area of contact with the rinse, the rinse is positively held in the clearance to ensure a stable liquid film to form between the top face and the backside of the wafer to form a liquid seal to prevent flow of developing solution or rinse solution (applied inside the ring) (see e.g., col 7, lines 32-37; 1-10).

It is clear that Tanaka does not show Applicants disclosed and claimed structure including Applicants structure or structure able to accomplish Applicants function "a knife ring having a base and a tapered edge comprising an upper edge of said knife ring extending from said base, said knife ring vertically adjustably mounted beneath said support to position said knife ring upper edge adjacent said substrate backside;"

Examiner argues that it is old and well known to substitute automatic arrangement for manual arrangements (to achieve the

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same result), citing *In re Venner*, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958). Even assuming *arguendo* that *In re Venner* is applicable law, Examiner has not shown in the prior art Applicants apparatus (knife ring or knife ring upper edge as claimed) or an apparatus that is taught to be capable of accomplishing Applicants disclosed and claimed invention or of achieving the same results (**adjustably controlling liquid flow on said substrate backside during said development process**).

Rather, there is **no motivation** to modify the ring of Tanaka to provide a vertical adjustment mechanism adjustable **during the development process** to adjust the ring of Tanaka since the upper face (not a tapered edge) it is set at a fixed distance **during the development process** from the substrate backside to continuously form a liquid seal ring (see col 7, line 1).

Such modification would **change the principle of operation** of Tanaka and **make it unsuitable for its intended purpose**.

"Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947

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*F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).*

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).*

"Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered." See, e.g., *Diamond v. Diehr, 450 U.S. at 188-189, 209 USPQ at 9.*

Moreover, nowhere do Tanaka et al. recognize or provide a solution to the problem that Applicants have recognized and solved by their disclosed and claimed invention:

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"An apparatus for dispensing a liquid onto a substrate frontside and backside during a development process and adjustably controlling liquid flow on said substrate backside during said development process to improve a rinsing step,"

Rather, the apparatus of Tanaka et al. presents the very problem that Applicants disclosed and claimed invention solves.

Applicants respectfully note that Examiner has mischaracterized Applicants arguments; Applicant has not attempted to distinguish over Tanaka with respect to the process performed, but rather has distinguished over the structure/functional relationship of the knife ring of Tanaka et al., which would not be able to accomplish the claimed structure/function relationship of Applicants knife ring and knife ring edge that Applicants have disclosed and claimed.

See also 2111.03, relating to the weight given the preamble in an apparatus claim:

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the



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claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

If a prior art structure is capable of performing the intended use as recited in the preamble, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

Even if the prior art device performs all the functions recited in the claim, the prior art cannot anticipate the claim if there is any structural difference. It should be noted, however, that means plus function limitations are met by structures which are equivalent to the corresponding structures recited in the specification. *In re Ruskin*, 347 F.2d 843, 146 USPQ 211 (CCPA 1965) as implicitly modified by *In re Donaldson*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994).

Nevertheless, the prior art (Tanaka) does **not disclose or suggest** Applicants disclosed and claimed **structure**.

#### Conclusion

The cited reference does not **produce or suggest** Applicants disclosed and claimed invention, or recognize or suggest a solution to the problem that Applicants have recognized and solved and therefore is insufficient to make out a *prima facie* case of obviousness with respect to both Applicants independent and dependent claims.

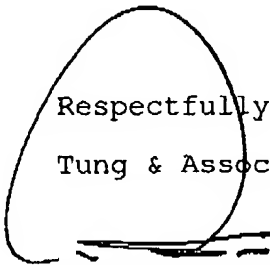
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Based on the foregoing, Applicants respectfully request reconsideration of their claims and submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited."

In the event that the present invention as claimed is not in condition for allowance for any reason, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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